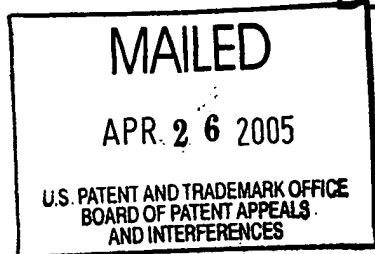


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The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

## UNITED STATES PATENT AND TRADEMARK OFFICE

### BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES



Ex parte HENRI M. ROUGEOT, ALAIN JEAN,  
HABIB MANI and ZIAD AZIZ SHUKRI

Appeal No. 2005-0625  
Application No. 09/334,671

ON BRIEF

Before HAIRSTON, BARRETT, and RUGGIERO, Administrative Patent Judges.  
HAIRSTON, Administrative Patent Judge.

### DECISION ON APPEAL

This an appeal from the final rejection of claims 1 through 12 and 14 through 21.

The disclosed invention relates to an x-ray image detector that comprises an active matrix substrate, a photoreceptor made of a co-planar thin layer of amorphous selenium based multilayer structure deposited over the active matrix substrate, a light-transparent biasing electrode that covers the photoreceptor and an x-ray conversion scintillator

provided on top of the biasing electrode. The x-rays that impinge the scintillator are converted into light by the scintillator, and the light is thereafter converted into electrical signals by the photoreceptor. The x-ray to light conversion denotes an indirect conversion to electrical signals.

Claim 1 is the only independent claim on appeal, and it reads as follows:

1. An indirect x-ray image detector suitable for radiology, comprising an active matrix substrate with scanning and read-out circuits, wherein over said active matrix substrate there is deposited a photoreceptor made of a co-planar thin layer of amorphous selenium based multilayer structure, said photoreceptor being covered with a light-transparent biasing electrode on top of which there is provided an x-ray conversion scintillator.

The references relied on by the examiner are:

Kwasnick et al. (Kwasnick)	5,132,539	July 21, 1992
Schiebel et al. (Schiebel)	5,396,072	Mar. 7, 1995
Perez-Mendez	5,596,198	Jan. 21, 1997
Morton	5,693,947	Dec. 2, 1997
Polischuk et al. (Polischuk)	5,880,472	Mar. 9, 1999
Brauers et al. (Brauers)	6,128,362	Oct. 3, 2000
		(filed Sept. 30, 1997)

Claims 1 through 5, 14 and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Morton in view of Perez-Mendez and Schiebel.

Claims 6 through 11, 15 through 17 and 19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Morton in view of Perez-Mendez, Schiebel and Polischuk.

Claim 12 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Morton in view of Perez-Mendez, Schiebel, Polischuk and Brauers.

Claims 18 and 21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Morton in view of Perez-Mendez, Schiebel and Kwasnick.

Reference is made to the briefs and the answer for the respective positions of the appellants and the examiner.

### OPINION

We have carefully considered the entire record before us, and we will sustain the obviousness rejections of claims 1 through 11 and 14 through 21, and reverse the obviousness rejection of claim 12.

Turning first to the obviousness rejection of claim 1, we agree with the examiner's findings (answer, pages 4 and 5) that Morton discloses (Figures 6 and 7) an indirect x-ray image detector suitable for radiology that comprises an active matrix substrate 102, a co-planar thin photoreceptor layer 201 of intrinsic hydrogenated amorphous silicon (a-Si:H), a light-transparent biasing electrode 202 on top of the photoreceptor layer 201 and a cesium iodine (CsI) x-ray conversion scintillator 300 located on the light-transparent biasing electrode. We additionally agree with the examiner's finding (answer, page 5) that Morton lacks a photoreceptor layer of "amorphous selenium based multilayer structure." For such a teaching, the examiner turns to Perez-Mendez which discloses (Figure 3;

column 6, lines 57 through 67) that the multilayer a-Si:H structure 58 through 60 can alternatively be made of amorphous selenium<sup>1</sup> which has like properties to the a-Si:H.

In view of the known alternative use of amorphous selenium and a-Si:H in indirect x-ray image detectors, we agree with the examiner (answer, page 6) that it would have been obvious to one of ordinary skill in the art to use an “amorphous selenium based multilayer structure” in Morton in lieu of the a-Si:H. To the extent that the disclosed and claimed multilayer structure is co-planar<sup>2</sup>, the multilayer structure in Morton, as modified by the teachings of Perez-Mendez, is a “co-planar” photoreceptor layer. Appellants’ argument (brief, page 7) that a photoreceptor is not disclosed in the modified structure of Morton is without merit because both Morton as well as Perez-Mendez are concerned with photons/light. Appellants’ arguments (brief, pages 7 through 9, 12 and 13; reply brief, pages 4 through 7) that Morton and Perez-Mendez operate as pixelated structures whereas the claimed invention operates as a non-pixelated structure is equally without merit inasmuch as the claimed invention as set forth in claim 1 on appeal is not limited to a non-pixelated structure. Thus, the obviousness rejection of claim 1 is sustained because the examiner did not have to resort to “a hindsight-based obviousness analysis” to demonstrate the obviousness of claim 1 (brief, page 11).

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<sup>1</sup> The teachings in Schiebel (Figure 3b; column 5, lines 29 through 49) of the use of amorphous selenium in x-ray image detectors are cumulative to those found in Perez-Mendez.

<sup>2</sup> Appellants never explained in the disclosure (specification, pages 4, 7 and 8) what the amorphous selenium multilayer structure is co-planar to in the detector structure.

The obviousness rejection of claims 2 through 5 and 14 is sustained because the appellants have chosen to let these claims stand or fall with claim 1 (brief, page 6).

The obviousness rejection of claim 20 is sustained because Perez-Mendez discloses (column 3, lines 45 through 48) that “[t]he CsI in the scintillator layer may be doped with Na to provide a predominantly blue light emission . . . .”

The obviousness rejection of claims 6 through 11, 15 through 17 and 19 is sustained because appellants have not presented any patentability arguments for these claims.

The obviousness rejection of claim 12 is reversed because the examiner has not pointed to any evidence in the record that each of the n and p layers in the multilayer structure should be less than 1  $\mu\text{m}$  in thickness. The electron trapping selenium layer 103 in Brauers is not pertinent to the claimed amorphous selenium photoreceptor.

The obviousness rejection of claim 18 is sustained because we agree with the examiner (answer, pages 11 and 12) that “Kwasnick *et al.* teach that the indices of refraction of the scintillator and the photodetector should be matched in order for the photons to readily pass from the scintillator into the photodetector (column 3, lines 16-24).”

The obviousness rejection of claim 21 is sustained because it would have been obvious to the skilled artisan to extend the scintillator cover teachings in Kwasnick to other parts of an x-ray imager that need protection from outside sources that may interfere with the operation of the x-ray imager.

DECISION

The decision of the examiner rejecting claims 1 through 12 and 14 through 21 under 35 U.S.C. § 103(a) is affirmed as to claims 1 through 11 and 14 through 21, and is reversed as to claim 12.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv).

AFFIRMED-IN-PART

  
KENNETH W. HAIRSTON  
Administrative Patent Judge

  
LEE E. BARRETT  
Administrative Patent Judge

  
JOSEPH F. RUGGIERO  
Administrative Patent Judge

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